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## Stressful life events and adolescents' mental health

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## **Chapter 3**

### **Generation of interpersonal stressful events: The role of poor social skills and early physical maturation in young adolescents**

This chapter is based on: Bakker, M. P., Ormel, J., Lindenberg, S., Verhulst, F. C., & Oldehinkel, A. J. (in press). Generation of interpersonal stressful events: The role of social skills and early physical maturation in young adolescents. The TRAILS study. *Journal of Early Adolescence*.

### **Abstract**

This study developed two specifications of the social skills deficit stress generation hypothesis: the “gender-incongruence” hypothesis to predict peer victimization and the “need for autonomy” hypothesis to predict conflict with authorities. These hypotheses were tested in a prospective large population cohort of 2064 Dutch young adolescents. Social skills and pubertal timing were measured when the sample was about eleven years old, and stressful life events were measured at follow-up two-and-a-half years later. As predicted by the gender-incongruence hypothesis, poor assertion in boys and poor self-control in girls were associated with peer victimization. Consistent with the need for autonomy hypothesis, poor self-control was associated with conflict with authorities, in both boys and girls. Furthermore, early physical maturation exacerbated the effect of poor self-control on conflict with authorities for both genders. These specific associations provide more insights in the pathways that result in the experience of interpersonal stressors in young adolescents.

## Introduction

Adolescence has been characterized as a transitional period that is marked by a ‘pile-up’ of stressful events (Arnett, 1999; Larson & Ham, 1993; Rudolph, 2002; Rudolph & Hammen, 1999). Some stressors may have more detrimental effects over time than others. Previous research showed that peer victimization (e.g. bullying) and conflict with authorities (e.g. school administrators and police) during childhood and adolescence are associated with current and future maladjustment, for instance as expressed in anxious-depressed symptoms, antisocial behaviors, and academic- and work-related problems (e.g. Finnegan, Hodges, & Perry, 1998; Hemphill, Toumbourou, Herenkohl, McMorris, & Catalano, 2006; Hoglund, 2007; Kokko & Pulkkinen, 2000; Moffitt, 1993; Moffitt, Caspi, Harrington, & Milne, 2002; Olweus, 1992). Thus, peer victimization and conflict with authorities during early adolescence can lead to an accumulation of problems later in life, and it seems therefore imperative to identify risk factors that predispose young adolescents to these stressful life events. In this paper, we would like to focus on the role of social skill deficits for both peer victimization and conflict with authorities.

The social skills deficit stress generation hypothesis suggests that people with poor social skills experience more interpersonal stressful events than socially skilled people (Hammen, 2006; Segrin, 2001). Several studies have found support for this hypothesis, that is, poor social skills are likely to contribute to the generation of interpersonal stress (Daley et al., 1997; Davila, Hammen, Burge, Paley, & Daley, 1995; Segrin, 2001). However, this hypothesis does not specify under what conditions social skills deficits are associated with interpersonal stressors. Or put in other words, specific types of social skills deficits may predispose adolescents to experience specific types of interpersonal stressors (Segrin, 2001). As it is used here, a deficit in a social skill refers to being less able to engage in appropriate and effective interactions with others (e.g. Lorr, Youniss, & Stefic, 1991; Segrin, 1999, 2001). It does not refer to a pathological characteristic.

Two kinds of social skills seem especially important to successfully traverse interpersonal situations with peers and adults during adolescence: assertiveness and self-control. Assertive adolescents have the ability to start conversations with others, express feelings and wants, and defend themselves against “unjust” demands (Lorr et al., 1991). Adolescents with good self-control skills have the ability to control impulses, alter emotions and thoughts, interrupt undesired behavioral tendencies, and refrain from acting on them (De Kemp et al., 2009). We postulate that young adolescents with deficits in these social skills are likely to be susceptible to peer victimization and conflict with authorities.

This study aims to extend the social skills deficit stress generation hypothesis by investigating how assertion deficits and self-control deficits play out for victimization by peers and conflict with authorities in young adolescent boys and girls. In the following, we will therefore propose a “gender-incongruence” specification of the social skills deficit stress generation hypothesis for peer victimization, and a “need for autonomy” specification of the social skills deficit stress generation hypothesis for conflict with authorities. Additionally, early physical maturation compared to same-sex, same-age peers has been shown to be a

stressful developmental challenge for both boys and girls (e.g. Ge, Conger, & Elder, 2001; Ge et al., 2003; Kaltiala-Heino, Marttunen, Rantanen, & Rimpelä, 2003). Therefore, we will investigate whether early physical maturation exacerbates the negative effects of social skills deficits on peer victimization and conflict with authorities during early adolescence.

### ***Peer victimization***

Adolescents who do not “fit in” are more likely to be victimized by peers (Graham & Juvonen, 2002; Nadeem & Graham, 2005; Wright, Giammarino, & Parad, 1986). With regard to victimization, it stands to reason that social skill deficits are more noticeable if they are gender incongruent, i.e. if they are more “out of character” and more in the way of “fitting in”. Thus, the more deviant the deficit is from normative gender appropriate behavior, the more likely that others exploit it. This leads us to formulate explicit gender-specific expectations about how these deficits play out for victimization.

Consistent with the stress generation model, we propose that boys and girls who show gender-incongruent social skills evoke negative responses from peers, which make them more susceptible to victimization (Hammen, 2006). Since boys (at least in Western societies) are generally expected to be assertive and show externalizing behaviors (Baumeister & Sommer, 1997; Geary, Byrd-Craven, Hoard, Vigil, & Numtee, 2003; Gjerde, 1995; Kochenderfer & Ladd, 1997; Pellegrini & Bartini, 2001; Troisi, 2001), poor assertion skills in boys are more incongruent with behavioral expectations than poor self-control. Thus, for boys, poor assertion skills are likely to elicit more victimization by peers than poor self-control. Conversely, girls are expected to show more affiliative and internalizing behaviors than physical or externalizing behaviors (e.g. Baumeister & Sommer, 1997; Cyranowski et al., 2000; Geary et al., 2003; Gjerde, 1995; Kochenderfer & Ladd, 1997; Troisi, 2001). Poor self-control in girls is thus likely to be more incongruent with gender appropriate behavior than poor assertion, and should therefore lead to more victimization in girls.

According to the social misfit hypothesis of pubertal timing, early maturers are perceived as social deviants or “misfits” by same-age peers and therefore targeted for victimization (e.g. Nadeem & Graham, 2005). Thus, boys and girls who show gender-incongruent social skills, and who are also more physically matured than same-sex, same-age peers might be particularly likely to be labeled as “social deviants” and to be singled out for peer victimization during early adolescence.

### ***Conflict with authorities***

During adolescence, boys and girls strive for an increase in freedom to make own decisions and gain autonomy (Pinquart & Silberseisen, 2002). The growing need for autonomy in adolescents is likely to result in increasing conflicts and disagreement with adults (Agnew, 2003; Branje, Van Doorn, Van der Valk, & Meeuws, 2009; Pinquart & Silberseisen, 2002), mostly due to discrepant expectations regarding appropriate behavior and timing of transitions in authority, autonomy, and responsibilities (Branje et al., 2009; Deković, Noom, & Meeuws, 1997).

In Western societies, assertive behavior is considered an appropriate response of adolescents to disagreements about autonomy (Markus & Lin, 1999). Open disagreement is allowed or even expected as a way of resolving differences (Markus & Lin, 1999; Phinney, Kim-Jo, Osorio, & Vilhjálmsdóttir, 2005). Having assertion skills entails that adolescent boys and girls are able to negotiate and discuss disagreements appropriately (Lorr et al., 1991). Assertive adolescents may defend their rights rigorously, but are unlikely to respond with rulebreaking or antisocial behaviors. Young adolescent boys and girls with poor assertion skills are, in our view, also unlikely to get into conflict with authority figures because of their relatively timid character (e.g. Lorr et al., 1991). Adolescents with poor self-control, on the other hand, lack the ability to control their impulses and emotions when confronted with restrictions by adults (De Kemp et al., 2009). Thus, when confronted with restrictions, adolescents with poor self-control are likely to act out with rulebreaking and antisocial behaviors (e.g. Krueger, Caspi, Moffitt, White, & Stouthamer-Loeber, 1996; Luengo, Carrillo-de-la-Pena, Otero, & Romero, 1994; Vazsonyi & Belliston, 2007; White et al., 1994), which in turn increase the probability of confrontations with authority figures (e.g. Moffitt, 1993). We therefore propose that poor self-control, rather than (poor) assertion, is associated with conflict with authorities during early adolescence.

The need for autonomy is generally higher for early maturing adolescents than for later maturing adolescents (Sentse et al., in press). Early maturing adolescents are most likely trapped in a maturity gap (Moffitt, 1993; Waylen & Wolke, 2004; Williams & Dunlop, 1999). Despite their biological maturation, adult social status is withheld and authority figures still set rules and exert control over them (Agnew, 2003). These perceived restrictions might lead to expressions of frustration, especially in early maturers with self-control deficits, who may be more inclined to impulsively undermine rules. Thus, for boys and girls with poor self-control, early physical maturation should exacerbate the chance of getting into conflict with authorities.

### ***The present study***

The aim of this study was to develop and test two specifications of the social skills deficit stress generation hypothesis in a prospective large population cohort of Dutch young adolescents. On the basis of the “gender-incongruence” specification we hypothesized that in boys, peer victimization would be associated with poor assertion rather than with poor self-control, while in girls, it would be associated with poor self-control rather than with poor assertion. Based on the “need for autonomy” specification, we hypothesized that conflict with authorities would be more strongly associated with poor self-control than with (poor) assertion in both boys and girls. Additionally, we expected that early physical maturation would aggravate the effects of these social skills deficits on peer victimization and conflict with authorities.

### Methods

#### *Sample*

Subjects were participants of the 'TRacking Adolescents' Individual Lives Survey' (TRAILS), a prospective cohort study of Dutch adolescents, aimed at explaining the development of mental health from pre-adolescence into adulthood. The TRAILS study was approved by the Central Committee on Research Involving Human Subjects (Dutch CCMO). The three largest cities in the North of the Netherlands were selected as well as two randomly selected rural areas. The five municipalities were requested to give names and addresses of all inhabitants born between October 1, 1989, and September 30 (first two municipalities: mean age = 11.29 years, SD = 0.52, range = 10.0 - 12.0) or October 1, 1990, and September 30, 1991 (last three municipalities: mean age = 10.72 years, SD = 0.37, range = 10.0 - 11.5). Two birth cohorts were used to minimize the age range during the initial assessment. A detailed description of the sampling procedure and methods is provided in Huisman et al. (2008).

Of all the children approached (N = 3145), 6.7% (n = 211) were excluded because of mental or physical incapability or language problems. Of the remaining 2934 children, 76.0% (N = 2230, mean age = 11.09, SD = 0.56, range = 10.0 - 12.0, 50.8% girls) were enrolled in the study (i.e. both child and parent agreed to participate). Of the 2230 baseline participants, 96.4% (N = 2149) participated in the first follow-up (mean age = 13.56, SD = 0.53, range = 12.0-15.0, 51.0% girls), held two to three years after baseline (T1) (mean number of months = 29.44, SD = 5.37, range = 16.69 - 48.06).

The present study is based on data from both the baseline (T1) and follow-up (T2) assessment wave. Written informed consent was obtained from the parents and from the adolescents themselves at both assessment waves. During these waves, questionnaires were filled out by the adolescents, their parents, and their teachers. The adolescents filled out their questionnaires at school, in the classroom, under the supervision of one or more TRAILS assistants. Responders and nonresponders did not significantly differ in levels of problem behaviors or sociodemographic variables (Huisman et al., 2008).

For the present study, valid data on stressful life events, social skills and pubertal timing were available for 2064 adolescents (96.0% of the total sample: boys N = 1004, girls N = 1060). Adolescents who dropped out between T1 and T2 (n = 81) scored lower on T1 assertion than those who participated at both assessment waves (nonresponders: mean = -0.41, SD = 0.84; responders: mean = 0.02, SD = 0.92; *t*-test: *t* = 4.275, *p* < .001). Nonresponders also had a statistically significant higher Tanner score at T1 (nonresponders: mean = 2.11, SD = 0.89; responders: mean = 1.87, SD = 0.74; *t*-test: *t* = -2.408, *p* < .05). Responders and nonresponders did not differ regarding gender (Chi-square test:  $\chi^2 = 0.87$ , *p* = 0.35) and T1 self-control (*t*-test: *t* = 1.873, *p* = 0.06). Although the attrition rate was low, these results show that there were some differences between nonresponders and responders.

## Measures

*Stressful life events* - Stressful life events were assessed retrospectively with a self-report questionnaire at follow-up (T2), including 20 stressful life events. The items had a yes/no format to indicate whether or not the event had occurred in the last 2 years (between baseline (T1) and follow-up (T2)). For each stressful event experienced, adolescents could rate the severity as 0 = not unpleasant, 1 = somewhat unpleasant, 2 = rather unpleasant, or 3 = very unpleasant. We used this measure to exclude events that were not experienced as unpleasant.

Out of the list of 20 stressful life events, we selected those events that were likely to reflect either peer victimization or conflict with authority figures. Peer victimization (at school) includes physical, verbal and psychological forms of degrading actions by peers (e.g. Graham & Bellmore, 2007; Olweus, 1993). The following events were therefore included in the category of peer victimization: victim of physical violence, victim of sexual harassment (verbal and physical), victim of bullying at school, and victim of negative gossip at school. The category of conflict with authorities included the events: suspension from school, running away from home, and contact with police. The numbers of stressful events within these two categories were used as variables in the analyses.

*Social skills* – Social skills were assessed with the Social Skills Rating System (SSRS) at baseline (T1). The SSRS is a multi-rater social behavior assessment package which includes separate rating forms for teachers and parents (Gresham & Elliott, 1990). Both teacher and parent forms contain three subscales: Cooperation, Assertion, and Self-Control. The parent version includes an additional Responsibility subscale. Items were rated as 0 = not true, 1 = somewhat or sometimes true, or 2 = very often or often true. For the present study, we used the Assertion and Self-Control subscales of both the teacher and parent forms. Examples of assertion items from the teacher version of the SSRS are: “This student takes initiative to participate in group work and activities”, and “This student introduces himself to new people”. The parent version of the assertion scale includes items such as “My child starts conversations by himself instead of waiting for other to initiate communication”, and “My child is self-confident in social situations, such as during parties and group activities”. An item for the teacher form of self-control is: “This student reacts appropriately when pressured or teased by classmates”, while “My child remains calm during arguments with other children” is an item for the parent form. The internal consistency for the Assertion and Self-Control subscales in our sample were moderate to high (Cronbach’s alpha for teacher version: 0.88 and 0.91; for parent version: 0.75 and 0.80). Substantial evidence concerning the validity of the SSRS is available, please see the SSRS manual for more details (Gresham & Elliott, 1990). In our sample, the parent and teacher version of the two subscales correlated moderately with each other (Assertion:  $r = 0.32$ ,  $p < .001$ ; Self-Control:  $r = 0.29$ ,  $p < .001$ ).

Reports from different sources are needed to reduce rater bias and provide better estimates than those based on a single source (Noordhof, Oldehinkel, Verhulst, & Ormel, 2008; Verhulst, Koot, & Van der Ende, 1994). Previous studies have demonstrated that a combination of parent and teacher information results in an improvement of predictive power (Verhulst et al., 1994). Consistent with this, using information on social skills provided by



both parents and teachers is likely to result in better and more accurate estimates of the behavior of adolescents than using only one informant (Ruffalo, & Elliot, 1997). For these reasons, we computed a combined estimate using the mean of the standardized parent and teacher scores. When data of one informant was missing or unreliable (Teacher version: Assertion  $n = 302$ , Self-Control  $n = 302$ ; Parent version: Assertion  $n = 181$ , Self-Control  $n = 182$ ), the composite score was based on the other informant. The composite estimate was standardized to mean zero and standard deviation one, in which negative values reflect poor social skills.

*Pubertal timing* – The stage of pubertal development was assessed in the parent interview at baseline (T1) using schematic drawings of secondary sex characteristics associated with the five standard Tanner stages of pubertal development, in which stage 1 corresponds to infantile and stage 5 to complete puberty (Marshall & Tanner, 1969, 1970; Tanner & Whitehouse, 1982). Tanner stages are a widely accepted standard for assessment of physical development, and have demonstrated good reliability, validity and parent-child agreement (Dorn, Susman, Nottelmann, Inof-Germain, & Chrousos, 1990). The parent was provided with the five gender-appropriate drawings, and asked to select which ‘looked most like their child’. Children were classified into one of the five stages of puberty.

Previous research suggests that continuous measures are more effective to capture relative pubertal timing effects than categorical measures (Negri, Fung, & Trickett, 2008). Therefore, we used a continuous measure for relative pubertal timing, using a method comparable to the one developed by Huang, Biro, and Dorn (2009). We first calculated the mean expected Tanner stage, in a linear regression model in which Tanner stage at T1 was predicted by the age in months at T1 (age range = 122 to 144 months), separately for boys and girls. The relative timing was computed as the deviation score for each adolescent by subtracting the expected from the observed Tanner stage. Positive values reflected earlier physical maturation compared to same-sex, same-age peers. This scale was skewed to the right, which is plausible considering the relatively young age of the sample (girls: range = -1.59 to 2.98; boys: range = -0.61 to 3.39). These gender-specific deviancy scores of physical maturation were used in the analyses.

### ***Statistical analyses***

Multiple linear regression analyses were used to test the stress generating effects of poor assertion and poor self-control on peer victimization and conflict with authorities. All analyses were stratified by gender to investigate our hypotheses about gender-specific patterns in the association between the two types of social skills and the two types of interpersonal stressors. Two models were tested for each stressor category. The first model included the main effects of the social skills variables. In the second model, interactions with pubertal timing were added. For the analyses, all continuous variables were transformed to  $z$ -scores ( $M = 0$  and  $SD = 1$ ). The interaction terms of the social skills and pubertal timing were the product of two  $z$ -scores but were not standardized themselves. We report the unstandardized regression coefficients to be able to compare the study variables on the same scale, and to ease the interpretation of the interaction effects (Table 4).

To provide an impression of the effect size and facilitate the interpretation of the interaction effect, we wrote out multiple equations using simple slope analysis (Aiken & West, 1991). In these analyses, low and high levels of the predictor indicate one standard deviation below and above the mean, respectively, while holding all other variables to their sample means. The moderator variable in the present study was pubertal timing, with one standard deviation below the mean reflecting later maturation and one standard deviation above the mean reflecting early maturation.

## **Results**

### ***Descriptive statistics***

Gender-specific prevalence rates of the stressful life events are presented in Table 1. Girls reported more peer victimization, while boys reported more conflict with authorities. Boys had poorer assertion and self-control than girls. The effect sizes of these gender differences were small (Table 2). In general, for both boys and girls the study variables were weakly to moderately correlated with each other (Table 3).

**Table 1.** Prevalence rates of the specific interpersonal stressors during early adolescence, by gender

	Girls (N = 1060)	Boys (N = 1004)	Chi-Square test
	N (experienced event)	N (experienced event)	
Victim of physical violence <sup>a</sup>	59	74	$\chi^2 = 2.845, p = 0.09$
Victim of negative gossip at school <sup>a</sup>	254	127	$\chi^2 = 43.713, p < .001$
Victim of bullying at school <sup>a</sup>	218	175	$\chi^2 = 3.130, p = 0.08$
Victim of sexual harassment <sup>ac</sup>	101	44	$\chi^2 = 20.901, p < .001$
Out-of-school suspension	2	20	$\chi^2 = 15.940, p < .001$
Contact with police	34	93	$\chi^2 = 32.953, p < .001$
Running away from home	33	21	$\chi^2 = 2.059, p = 0.15$

<sup>a</sup> Stressful life events are dummy variables (0 = not experienced, 1 = experienced).

<sup>b</sup> Victimization experienced at school.

<sup>c</sup> Includes both verbal and physical forms of harassment.

**Bold:** statistically significant gender difference.

**Table 2.** Mean (standard deviations) of stressful life events, social skills and pubertal timing, by gender.

	Girls (N = 1060)		Boys (N = 1004)		Difference t-test / Cohens' d	
	Mean (SD) / Range	N	Mean (SD) / Range	N		
Peer victimization <sup>a</sup>	0.60 (0.85)	1060	0.42 (0.74)	1004	$t = 5.08^d$ , $df = 2050$ , $p < .001$ / $d = 0.22$	
Conflict with authorities <sup>a</sup>	0.07 (0.27)	1060	0.13 (0.38)	1004	$t = -4.66^d$ , $df = 1784$ , $p < .001$ / $d = -0.22$	
Assertion <sup>b</sup>	0.13 (0.82)	1060	-0.11 (0.85)	1004	$t = 6.55$ , $df = 2062$ , $p < .001$ / $d = 0.29$	
Self-control <sup>b</sup>	0.18 (0.77)	1060	-0.18 (0.88)	1004	$t = 9.80^d$ , $df = 1991$ , $p < .001$ / $d = 0.44$	
Pubertal timing <sup>c</sup>	-0.06 (0.80) / -1.59 – 2.98	1060	0.24 (0.57) / -0.61 – 3.39	1004		

<sup>a</sup> Sumscore.<sup>b</sup> Scores are based on mean standardized parent and teacher reports.<sup>c</sup> Gender-specific deviancy scores from the normative pubertal timing; positive values reflect early physical maturation compared to same-sex, same-age peers.<sup>d</sup> Test statistic adjusted for unequal variances.

**Table 3.** Correlations between stressful life events, social skills and pubertal timing, by gender.

	1.	2.	3.	4.
1. Peer victimization <sup>a</sup>				
Girls				
Boys				
2. Conflict with authorities <sup>a</sup>				
Girls	0.07**			
Boys	0.03			
3. Assertion <sup>b</sup>				
Girls	-0.04	-0.02		
Boys	<b>-0.16***</b>	<b>-0.09**</b>		
4. Self-control <sup>b</sup>				
Girls	<b>-0.10***</b>	<b>-0.08**</b>	<b>0.55***</b>	
Boys	<b>-0.14***</b>	<b>-0.21***</b>	<b>0.59***</b>	
5. Pubertal timing <sup>c</sup>				
Girls	0.06	<b>0.11***</b>	-0.03	-0.01
Boys	0.03	0.06	-0.03	<b>-0.08*</b>

<sup>a</sup> Sumscore.<sup>b</sup> Scores are based on mean standardized parent and teacher reports.<sup>c</sup> Gender-specific deviancy scores from the normative pubertal timing; positive values reflect early physical maturation compared to same-sex, same-age peers.**Bold:** statistically significant correlation; \* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ ***Effects of poor social skills and pubertal timing on peer victimization***

The multiple regression analyses were performed separately for boys and girls. In girls, poor self-control, but not poor assertion, was significantly associated with peer victimization. In boys, it was just the other way around. This supported our gender incongruence hypothesis for peer victimization. None of the interactions between social skills deficits and pubertal timing were statistically significant (Table 4a).

**Table 4a.** Main and interaction effects of T1 social skills and pubertal timing on T2 peer victimization, by gender.

	Peer victimization			
	Girls		Boys	
	Model 1 <sup>a</sup>	Model 2 <sup>a</sup>	Model 1 <sup>a</sup>	Model 2 <sup>a</sup>
	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>
Assertion	0.02 (0.58)	0.02 (0.59)	<b>-0.11 (-3.05)*</b>	<b>-0.11 (-3.01)*</b>
Self-control	<b>-0.13 (-2.99)*</b>	<b>-0.13 (-3.04)*</b>	-0.06 (-1.85)	-0.05 (-1.94)
Pubertal timing <sup>d</sup>	0.06 (1.87)	0.06 (2.01)	0.02 (0.82)	0.02 (0.87)
Ass*Pubtiming <sup>e</sup>		-0.02 (-0.06)		-0.05 (-1.40)
Slfc*Pubtiming <sup>e</sup>		-0.03 (-0.67)		0.05 (1.47)

<sup>a</sup> All continuous variables were standardized to *z*-scores ( $M = 0$ ,  $SD = 1$ ) for the analyses.

<sup>b</sup> Unstandardized regression coefficients are reported.

<sup>c</sup> *t*-statistic.

<sup>d</sup> Deviancy scores from the normative physical maturation (*z*-scores); positive values reflect early maturation compared to same-age peers.

<sup>e</sup> The interaction term is based on the product of two *z*-scores but was not standardized itself.

**Bold:** statistically significant effect; \*  $p < .01$

### ***Effects of poor social skills and pubertal timing on conflict with authorities***

Table 4b shows the gender-specific regression coefficients for assertion, self-control, and pubertal timing on conflict with authorities. In both boys and girls, poor self-control was statistically significantly associated with conflict with authorities, while (poor) assertion was not. The interaction between poor self-control and pubertal timing on conflict with authorities was statistically significant, in both boys and girls. These results supported the need for autonomy hypothesis

Simple slope analyses (Aiken & West, 1991) confirmed that, in both boys and girls, the effect of poor self-control on conflict with authorities was stronger in early-maturing than in later-maturing youth (boys: early maturation:  $B = -0.33$ ,  $t = -5.93$ ,  $p < .05$ ; later maturation:  $B = -0.14$ ,  $t = -2.26$ ,  $p < .05$ ; girls: early maturation:  $B = -0.17$ ,  $t = -3.61$ ,  $p < .05$ ; later maturation:  $B = -0.03$ ,  $t = -0.68$ ,  $p = .50$ ). These results are represented in Figures 1 and 2.

**Table 4b.** Main and interaction effects of T1 social skills and pubertal timing on T2 conflict with authorities, by gender.

	Conflict with authorities			
	Girls		Boys	
	Model 1 <sup>a</sup>	Model 2 <sup>a</sup>	Model 1 <sup>a</sup>	Model 2 <sup>a</sup>
	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>	<i>B<sup>b</sup></i> ( <i>t</i> ) <sup>c</sup>
Assertion	0.04 (1.31)	0.04 (1.35)	0.05 (1.07)	0.05 (1.06)
Self-control	<b>-0.10 (-3.00)**</b>	<b>-0.10 (-3.17)**</b>	<b>-0.24 (-5.88)***</b>	<b>-0.23 (-5.63)***</b>
Pubertal timing <sup>d</sup>	<b>0.08 (3.46)**</b>	<b>0.10 (4.00)***</b>	0.05 (1.38)	0.03 (0.75)
Ass*Pubtiming <sup>e</sup>		-0.01 (-0.26)		0.02 (0.48)
Slfc*Pubtiming <sup>e</sup>		<b>-0.07 (-2.13)*</b>		<b>-0.10 (-2.37)*</b>

<sup>a</sup> All continuous variables were standardized to *z*-scores (*M* = 0, *SD* = 1) for the analyses.

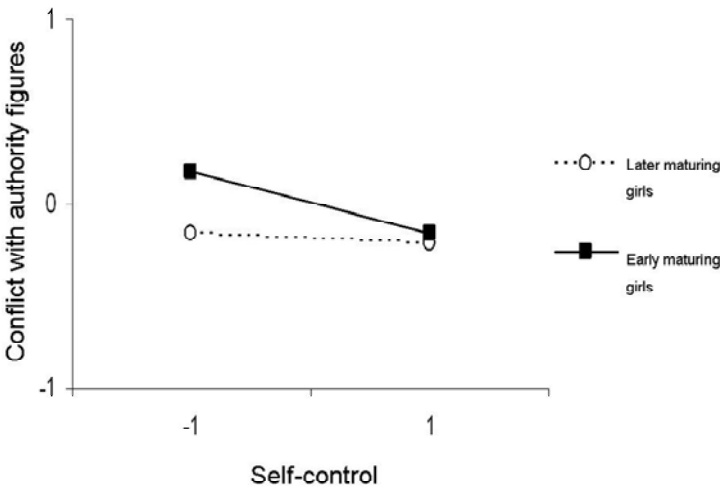
<sup>b</sup> Unstandardized regression coefficients are reported.

<sup>c</sup> *t*-statistic.

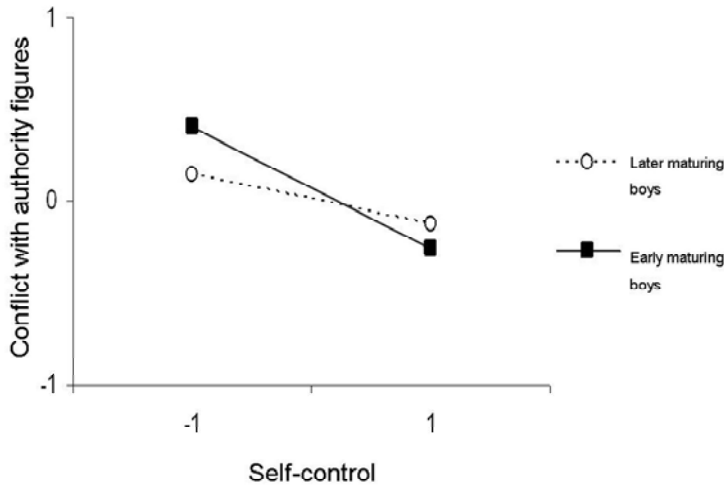
<sup>d</sup> Deviancy scores from the normative physical maturation (*z*-scores); positive values reflect early maturation compared to same-age peers.

<sup>e</sup> The interaction term is based on the product of two *z*-scores but was not standardized itself.

**Bold:** statistically significant effect; \* *p* < .05, \*\* *p* < .01, \*\*\* *p* < .001



**Figure 1.** Interaction between self-control and pubertal timing on conflict with authorities, for girls.



**Figure 2.** Interaction between self-control and pubertal timing on conflict with authorities, for boys.

## Discussion

### *Main findings*

Many adolescents experience stressful events. The social skills deficit stress generation hypothesis has contributed to our understanding of the factors that might help create such events. It has been supported in various studies (e.g. Daley et al., 1997; Davila et al., 1995; Segrin, 2001). However, it does not specify mechanisms by which the deficits trigger the stressful events and therefore, it does not allow us to make specific predictions for certain stressful events and for different subgroups. This study aimed to extend the social skills deficit stress generation hypothesis by proposing that assertion deficits and self-control deficits would play out differently for peer victimization and conflict with authorities in young adolescent boys and girls.

The results confirmed the gender-incongruence hypothesis. Poor assertion rather than poor self-control was associated with peer victimization in boys, while in girls poor self-control was associated with peer victimization rather than poor assertion. The results did not support the “social misfit” hypothesis of pubertal timing, which asserts that early maturers are more likely to be victimized because they are perceived as social deviants by same-age peers (Nadeem & Graham, 2005). Thus, early physical maturation may not be a risk factor for victimization when adolescents are already perceived as “social deviants” by showing gender-incongruent behaviors. Previous research suggests that adolescents’ behavioral characteristics might make them susceptible to specific types of experiences, which reinforce and sustain those characteristics (Caspi, Elder, & Bem, 1987; Caspi, Elder, & Bem, 1988). From this



perspective, assertion deficits might be perpetuated by peer victimization in boys, while self-control deficits might be perpetuated by peer victimization in girls. Because these gender-incongruent behaviors are likely to persist in these boys and girls, they may be at risk for prolonged peer victimization. Peer victimization during adolescence is likely to result in (longterm) mental health problems, for example, addictive behaviors or internalizing problems (Houbre, Tarquinio, Thuillier, & Hergott, 2006; Rosen et al., 2009). The relationship between peer victimization and internalizing problems is also likely to be reciprocal in nature (e.g. Hodges & Perry, 1999). Taken together, these findings might be indicative of a complex interplay between gender-incongruent social skills deficits, peer victimization and mental health problems during adolescence.

In support of the need for autonomy hypothesis, our results showed that poor self-control rather than (poor) assertion was associated with conflict with authorities in both genders. As expected, early physical maturation resulted in more conflict with authorities in boys and girls with deficits in self-control. Thus, early maturing boys and girls with poor self-control appear to be a high risk group for conflict with authorities. According to the labeling theory, adolescents who experience conflict with authorities might be labeled as rule breakers and trouble makers by parents or official authorities (e.g. school administrators), which contributes to develop (more) externalizing behaviors and attitudes (Bernburg, Krohn, & Rivera, 2006; De Kemp et al., 2009; Heimer & Matsueda, 1994). Consistent with this theory, conflict with authorities (e.g. out-of-school suspension) have been associated with the development of externalizing problems (e.g. Hemphill et al., 2006). Externalizing problems might also contribute to self-control deficits (De Kemp et al., 2009; Ge & Conger, 1999). Taken together, early maturing adolescents with poor self control could be susceptible to a persistent reciprocal cycle of externalizing behaviors and conflicts with authorities.

The reported regression coefficients of poor social skills and physical maturation on both types of interpersonal stress were noteworthy but not strong for both genders. Stress generation is probably for a large part due to multiple liabilities. Among other things, neuropsychological dysfunctions, personality traits, and psychopathology may also contribute to the occurrence of interpersonal stressful events (Hammen, 2006). Despite the small effects of social skills, poor social skills could nevertheless have long-term negative consequences (Segrin, 2001). If they contribute to both peer victimization and conflict with authorities, poor social skills may predispose adolescent boys and girls to enduring difficulties later in life.

### ***Limitations and strengths***

A limitation of this study is that the life events were measured retrospectively, without regard to contextual information and based on self-reports (Dohrenwend, 2006). Retrospective self-reports are susceptible to recall bias: people with mental health problems have been suggested to over-report the severity as well as the number of stressful life events (Dohrenwend, 2006, Monroe, 2008). Tentatively, recall bias in self-reports about peer victimization and conflict with authorities might be more pronounced in severity ratings than in occurrence ratings of these stressful life events (see Wagner, Abela, & Brozina, 2006). To

reduce the probability of state-related biases, we only used the number of stressful life events in the analyses, not their reported severity. Another potential limitation is that we cannot exclude the possibility that the conflict with authority items might partly be expressions of a lack of self-control, which could explain why the two variables are associated.

Important assets of this study are the size and representativeness of our sample, the use of multiple informants, the use of specific types of social skills, and the use of distinct types of interpersonal stressful life events as outcome measures. An additional asset of this study was the use of a continuous, rather than a categorical, measure to capture relative pubertal timing effects (Huang et al., 2009; Negri et al., 2008).

### ***Conclusion and implications***

To the best of our knowledge, this study was the first to investigate the role of specific types of social skills in predisposing young adolescents to specific types of interpersonal stress, that is, peer victimization and conflict with authorities. We worked out the mechanisms that are likely to link social skills deficits to peer victimization and conflict with authorities for boys and girls. This allowed us to integrate social skills deficits with different events, gender and maturation effects. These specific associations give more insights into the pathways that result in the experience of interpersonal stressors in boys and girls.

Our results indicate that prevention and intervention strategies against peer victimization might benefit from taking a gender-specific approach. Tentatively, it appears important to teach girls at risk for victimization more self-control, whereas for at risk boys efforts should be focused on improving their assertiveness. Parents, teachers and clinicians should also be aware that early maturing boys and girls with self-control deficits appear to be especially at risk for conflict with authorities. This suggests that it is important to give special attention to self-control in this subgroup of young adolescents to prevent them from getting into persistent difficulties later in life (e.g. Hemphill et al., 2006; Moffitt et al., 2002).

